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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SOL, ANTHONY M

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/620,866	Applicant(s) BRYANT ET AL.	
	Examiner Anthony Sol	Art Unit 2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21, 23-26 and 28-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-32 is/are allowed.
- 6) ☒ Claim(s) 1-21, 23-26 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/19/2008, 8/5/2008, 9/24/2008, 9/24/2008,</u> | 6) <input type="checkbox"/> Other: _____ |
| <u>11/5/2008</u> | |

DETAILED ACTION

- Applicant's Amendment filed 8/20/2008 is acknowledged.
- The previous objections to claims 23, 24 and 28 are withdrawn.
- Claims 1, 9, 10, 18, 19, 23, 24, and 28-32 have been amended.
- Claims 1-21, 23-26, and 28-32 remain pending.

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 9, 23, and 30 are rejected under 35 U.S.C. 101 because the computer readable medium as defined in the specification on paragraph 72 includes signals, which is non-statutory, because it states:

"Various forms of computer readable media may be involved in carrying one or more sequences of one or more instructions to processor 144 for execution."

The paragraph continues on to describe the various forms involved including:

"send[ing] the instructions over a telephone line using a modem", infrared transmitter, bus, etc. to carry the instruction where these are all propagation medium. The paragraph as a whole describes various forms of computer readable medium including propagation medium.

(see applicant's specification at para. [0072]).

And since signals and propagation medium are used to send instructions over a telephone line using a modem, infrared transmitters, etc., claims 9, 23, and 30 are directed non-statutory subject matter.

It is suggested that the first sentence of paragraph [0072] of the specification be deleted. Specifically, the following sentence:

“Various forms of computer readable media may be involved in carrying one or more sequences of one or more instructions to processor 144 for execution.”

Appropriate corrections are required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 6-11, and 15-18, are rejected under 35 U.S.C. 102(e) as being anticipated by Pub. No. US 2002/0136223 A1 (“Ho”).

Regarding claims 1, 2, 6-11, and 15-18,

Ho shows in fig. 2 a forwarding node 16d and a tunnel end point 16b both in the same data communication network, MPLS Network (see label "boundary of MPLS network in fig. 2"), and both transmitting tunneled packets using the same data communication protocol (para. 27, *ATM data is transported using Constraint-based Routed Label Switched Paths or CR-LSPs*). Please see paras. 27-30. **Note** that fig. 2 clearly shows the "boundary of MPLS network" encircling routers 16a, 16b, 16c, 16d, which suggests a common data communication protocol utilized by all the routers, wherein 16d is the forwarding node and 16b is the tunnel endpoint. **Note** also that fig. 2 shows an arrow pointing to router 16d with a caption that reads "penultimate hop popping can be used to remove need for extra lookup at ATM aware LSR," wherein ATM aware LSR is LSR16b.

Ho discloses recognizing a tunneled packet comprising an address directly identifying a neighbor node 16b to the forwarding node 16d as the tunnel end point (see para. 28, ***The Abstract trunk 18 carries ATM traffic between two ATM aware LSRs 16 without regards to the ultimate destination endpoint of the data by means of a hierarchy. In the label stack of a labelled MPLS packet traversing Abstract Trunk 18, a label at another level of the stack is used to identify the destination interface, or the destination ATM interface cards and connection endpoint of the traffic. It will be appreciated that this arrangement allows different VPCs (Virtual Path Connections) and VCCs (Virtual Channel Connections) to share one Constraint-based Routed-Label Switched Path (CR-LSP), even if they terminate on different ATM interface cards*** Preferably, all CR-LSPs which terminate on the IP address of a PNNI entity (i.e. an ATM

*aware LSR) utilize penultimate hop popping in order to remove the need for additional label lookup and label pop operations at the ATM aware LSP 16 at the egress of the CR-LSP; para. 32, The labels of a MPLS labelled packet are arranged into a label stack. The encapsulation of ATM cells (or CPCS-PDUs for AAL-5 traffic) for transport in a MPLS packet uses three labels in the label stack. The topmost label corresponds to the CR-LSP that is used to transport the MPLS packet between the ATM aware LSRs 16. The label beneath the top of the label stack corresponds to the final destination ATM interface or ATM interface card for the traffic These first two labels can be encoded using standard MPLS encoding techniques such as described by Rosen, et al. in MPLS Label Stack Encoding. IETF Draft, September 1999. The bottom label comprises an ATM shim label 30 as shown in FIG. 4). Therefore, when the forwarding node 16d receives the MPLS packets, the penultimate hop popping is performed on the topmost label containing the IP address of the LSR 16b, the tunnel end point. **Note** that the CR-LSP terminates on the IP address of the tunnel endpoint LSR 16b, which is the claimed neighbor node.*

Ho further discloses removing the header and forwarding the payload to the neighbor node. (para. 34, *In operation when a MPLS labelled packet arrives on a CR-LSP at the ATM aware LSR 16 that is the endpoint of the CR-LSP, penultimate hop popping should preferably have **already removed the label** corresponding to the transporting CR-LSP).*

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3-5, 12-14, 19-21, 23-26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable Ho in view of Pub. No. US 2003/0053414 A1 ("Akahane").

Regarding claims 3 and 12,

Ho does not disclose that the recording step comprises a manual configuration recording step.

Akahane discloses setting Label Switched Paths manually by a network administrator (para. 9).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify signalling and routing protocols used in MPLS networks of Ho to include a manual configuration recording step as taught by Akahane. One skilled in the art would have been motivated to make the combination to allow for flexible configuration capabilities.

Regarding claims 4 and 13,

Ho discloses that MPLS encompasses new signalling protocols such as Label Distribution Protocol (LDP) which are used to create connections over a network and

uses network layer routing protocols (either existing or new protocols) to route these connections (para. 2).

Regarding claims 5 and 14,

Ho does not disclose the step of constructing as a repair path around a component in the data communications network a tunnel having a tunnel end point prior to issuing the notification from the tunnel end point.

Akahane shows in fig. 9, setting a Label Switch Paths from CR1 to CR3 to CR2 before utilizing the PHP method using LSP and LDP.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify signalling and routing protocols used in MPLS networks of Ho to include construction of a repair path around a component a tunnel before issuing the notification from the tunnel end point as taught by Akahane. One skilled in the art would have been motivated to make the combination to use a router in a backup path in an MPLS network (see Akahane, Abstract).

Regarding claims 19-21, 23-26, and 28,

Ho shows in fig. 2 a forwarding node 16d and a tunnel end point 16b both in the same data communication network, MPLS Network (see label "boundary of MPLS network in fig. 2"), and both transmitting tunneled packets using the same data communication protocol (para. 27, *ATM data is transported using Constraint-based Routed Label Switched Paths or CR-LSPs*). Please see paras. 27-30. **Note** that fig. 2

clearly shows the "boundary of MPLS network" encircling routers 16a, 16b, 16c, 16d, which suggests a common data communication protocol utilized by all the routers, wherein 16d is the forwarding node and 16b is the tunnel endpoint. **Note** also that fig. 2 shows an arrow pointing to router 16d with a caption that reads "penultimate hop popping can be used to remove need for extra lookup at ATM aware LSR," wherein ATM aware LSR is LSR16b.

Ho discloses recognizing a tunneled packet comprising an address directly identifying a neighbor node 16b to the forwarding node 16d as the tunnel end point and a payload (see para. 28, ***The Abstract trunk 18 carries ATM traffic between two ATM aware LSRs 16 without regards to the ultimate destination endpoint of the data by means of a hierarchy. In the label stack of a labelled MPLS packet traversing Abstract Trunk 18, a label at another level of the stack is used to identify the destination interface, or the destination ATM interface cards and connection endpoint of the traffic. It will be appreciated that this arrangement allows different VPCs (Virtual Path Connections) and VCCs (Virtual Channel Connections) to share one Constraint-based Routed-Label Switched Path (CR-LSP), even if they terminate on different ATM interface cards Preferably, all CR-LSPs which terminate on the IP address of a PNNI entity (i.e. an ATM aware LSR) utilize 'penultimate hop popping' in order to remove the need for additional label lookup and label pop operations at the ATM aware LSP 16 at the egress of the CR-LSP; para. 32, The labels of a MPLS labelled packet are arranged into a label stack. The encapsulation of ATM cells (or CPCS-PDUs for AAL-5 traffic) for transport in a MPLS packet uses three labels in the label stack. The topmost label***

corresponds to the CR-LSP that is used to transport the MPLS packet between the ATM aware LSRs 16. The label beneath the top of the label stack corresponds to the final destination ATM interface or ATM interface card for the traffic. These first two labels can be encoded using standard MPLS encoding techniques such as described by Rosen, et al. in MPLS Label Stack Encoding. IETF Draft, September 1999. The bottom label comprises an ATM shim label 30 as shown in FIG. 4). Therefore, when the forwarding node 16d receives the MPLS packets, the penultimate hop popping is performed on the topmost label containing the IP address of the LSR 16b, the tunnel end point. **Note** that the CR-LSP terminates on the IP address of the tunnel endpoint LSR 16b, which is the claimed neighbor node.

Ho further discloses notifying a forwarding node of the identity of the tunnel end point (para. 28, **The Abstract trunk 18 carries ATM traffic between two ATM aware LSRs 16;** para. 28, Preferably, all CR-LSPs which terminate on the IP address of a PNNI entity (i.e. an ATM aware LSR) utilize 'penultimate hop popping' in order to remove the need for additional label lookup and label pop operations at the ATM aware LSP 16 at the egress of the CR-LSP). **Note** that the traffic data is sent from one LSR 16 to the other using IP address of the ATM aware LSR (i.e., LSR 16b), as discussed above. And since penultimate hop popping is utilized, the forwarding node 16d, will receive the traffic data addressed to LSR16b.

Ho still further discloses removing the header and forwarding the payload to the neighbor node. (para. 34, In operation when a MPLS labelled packet arrives on a CR-LSP at the ATM aware LSR 16 that is the endpoint of the CR-LSP, penultimate hop

popping should preferably have ***already removed the label*** corresponding to the transporting CR-LSP).

Ho does not disclose the step of constructing as a repair path around a component in the data communications network a tunnel having a tunnel end point prior to issuing the notification from the tunnel end point.

Akahane shows in fig. 9, setting a Label Switch Paths from CR1 to CR3 to CR2 before utilizing the PHP method using LSP and LDP.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify signalling and routing protocols used in MPLS networks of Ho to include construction of a repair path around a component a tunnel before issuing the notification from the tunnel end point as taught by Akahane. One skilled in the art would have been motivated to make the combination to use a router in a backup path in an MPLS network (see Akahane, Abstract).

Allowable Subject Matter

1. Claims 29-32 are allowed.

Response to Arguments

7. Applicant's arguments filed 8/20/2008 have been fully considered but they are not persuasive.

- Applicant argues on pg. 14 of Remarks regarding claim 1 that the ATM interface does not "recognize a tunneled packet comprising an address

- directly identifying the neighbor node to the forwarding node as the tunnel end point," and does not "remove the header" as recited in claim 1.
- The examiner agrees the ATM interface does not recite the above limitation. It is the forwarding node 16d of fig. 2 that performs the limitation recited above as detailed in the rejection to amended independent claims, including claim 1.
 - The applicant further argues beginning on bottom of pg. 14 to the middle of pg. 15 that Ho's ingress "ATM aware LSR" does not "remove any header" and does not directly "forward the payload to the tunnel end point."
 - The examiner agrees the "ATM aware LSR" does not "remove any header" and does not directly "forward the payload to the tunnel end point." It is the forwarding node 16d of fig. 2 that performs the limitation recited above as detailed in the rejection to amended independent claims, including claim 1.
 - The applicant argues on pg. 15 that Ho's ingress "ATM aware LSR" and other MPLS nodes are not "a forwarding node and a tunnel end point" where the "forwarding node recognizes a tunneled packet comprising an address directly identifying the neighbor node to the forwarding node as the tunnel end point, removes the header."
 - The examiner respectfully disagrees. MPLS node LSR 16d of fig. 2 is a forwarding node and ATM aware LSR 16b is the tunnel end point wherein the

“forwarding node recognizes a tunneled packet comprising an address directly identifying the neighbor node to the forwarding node as the tunnel end point, removes the header.” Please see the rejection to amended independent claims, including claim 1, for details. But it should be emphasized again that it is the forwarding node LSR 16d that performs the limitation above.

- The applicant argues on pg.16 that penultimate removal pertains to the removal of a label, not “an address directly identifying the neighbor node.”
- The examiner respectfully disagrees. As detailed above in the rejection to claim 1, Ho discloses that “[t]he labels of a MPLS labelled packet are arranged into a label stack. The encapsulation of ATM cells (or CPCS-PDUs for AAL-5 traffic) for transport in a MPLS packet uses three labels in the label stack. The topmost label corresponds to the CR-LSP that is used to transport the MPLS packet between the ATM aware LSRs 16. The label beneath the top of the label stack corresponds to the final destination ATM interface or ATM interface card for the traffic These first two labels can be encoded using standard MPLS encoding techniques such as described by Rosen, et al. in MPLS Label Stack Encoding. IETF Draft, September 1999. The bottom label comprises an ATM shim label 30 as shown in FIG. 4). Therefore, when the forwarding node 16d receives the MPLS packets, the penultimate hop

- popping is performed on the topmost label containing the IP address of the LSR 16b, the tunnel end point. (see Ho, para. 32).
- The further argues on pg. 16 that egress "ATM aware LSR" and the ATM interface are not "a forwarding node and a tunnel point both in the same data communication network and both transmitting tunneled packets using the same data communication protocol" as claimed.
 - As detailed above in the rejection to claim 1, Ho shows in fig. 2 a forwarding node 16d and a tunnel end point 16b both in the same data communication network, MPLS Network (see label "boundary of MPLS network in fig. 2"), and both transmitting tunneled packets using the same data communication protocol (para. 27, *ATM data is transported using Constraint-based Routed Label Switched Paths or CR-LSPs*). Please see paras. 27-30. **Note** that fig. 2 clearly shows the "boundary of MPLS network" encircling routers 16a, 16b, 16c, 16d, which suggests a common data communication protocol utilized by all the routers, wherein 16d is the forwarding node and 16b is the tunnel endpoint.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Sol whose telephone number is (571)272-5949. The examiner can normally be reached on M-F 7:30am - 4pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/A. S./
Examiner, Art Unit 2419

/Wing F. Chan/
Supervisory Patent Examiner, Art Unit 2419
11/23/08